WHAT IS CLAIMED IS:

1. A communication and control system for a railway train which comprises at least one main engine and a plurality of carriages or wagons,

comprising

first and second bi-directional transmission lines which extend parallel to and spaced from one another along the train;

a control unit operating as a main unit installed on the said main engine and connected, in the said main engine, to both the said transmission lines and to brake control systems or devices of the train;

a plurality of slave control units each of which is installed upon a respective carriage or wagon and is connected, in the respective carriage or wagon, to both the said transmission lines, to solenoid valve units associated with pneumatic brake actuators, as well as two sensor devices associated with the carriage or wagon;

the main control unit and the slave control unit being arranged to communicated with one another via the said transmission lines according to a predetermined serial protocol;

the main control unit being arranged to transmit to the slave control unit brake command signals of serial type, and to receive and acquire information or state signals likewise of serial type from the said slave control units via at least one of the said transmission lines.

2. A system according to Claim 1 for a railway train comprising a lead or main engine and at least one further auxiliary engine;

the said auxiliary engine being also provided with a control unit capable of acting as a slave unit connected to the said transmission lines and arranged to receive

synchronisation signals coming from the control unit of the lead engine and to transmit information or state signals to the control unit of the lead engine via at least one of the said transmission lines.

3. A system according to Claim 1, wherein the main control unit is arranged to transmit brake control signals to the slave control units via one of the said transmission lines and to receive information signals coming from the said control units via the other of the said transmission lines.

4. A system according to Claim 1, wherein the control unit operating as main unit is arranged to detect and determine the location along the train of the position of a failure of one of the said transmission lines.

5. A system according to Claim 4, wherein the main control unit is arranged, in the case of a failure of one of the said transmission lines, to transmit at least the brake control signals and possible synchronisation signals for one or more auxiliary engines on the other of the said transmission lines.

6. A system according to Claim 1, wherein the slave control units are arranged to acquire and transmit signals on one or the other transmission line equally, and are moreover operable, when they receive a transfer command signal, to transfer to the other transmission line signals received on one line; the main control unit being arranged to detect a condition in which the said transmission lines are both interrupted, each between different pairs of slave control units, and in such a case to send transfer command signals to at least two slave control units from among those in which there is an interruption of one of the said transmission lines, in such a way that all the slave control units are

able to communicate with the main control units via a provisional transmission line comprising portions of both the said transmission lines and the slave control units which have been sent the said transfer command signals.

7. A system according to Claim 1, wherein the said transmission lines are further connected to electrical power supply devices which can be activated in at least one engine to distribute this power to the slave control unit.

8. A system according to ~~claims 6 and 7,~~ Claim 6 wherein the slave control units are arranged to allow the passage of electrical power from one transmission line to the other which are connected, when they receive the said transfer command signal, in such a way that when both the said transmission lines are interrupted, each between different pairs of slave control units, all the said slave control units can be supplied with electrical power propagated through the said provisional transmission line.

9. A system according to Claim 1, wherein the said transmission lines are travelling wave twin wire lines operable to transmit electrical power and serial type signals simultaneously.

10. A system according to Claim 1, adapted to operate in trains comprising one or more vehicles provided with a single transmission line.

add a1)